



PCT/GB2004/003162



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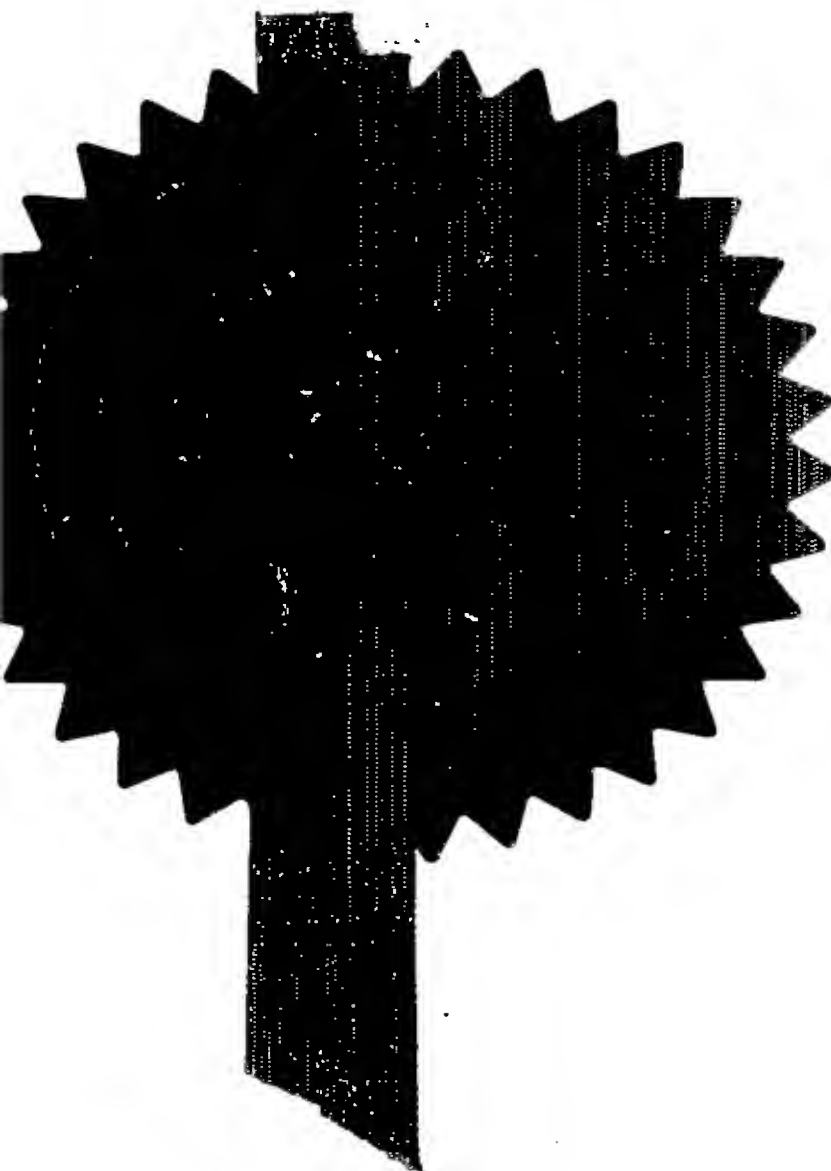
I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that the application is now proceeding in the name as identified herein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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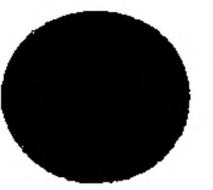
GB0317253.3

By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of

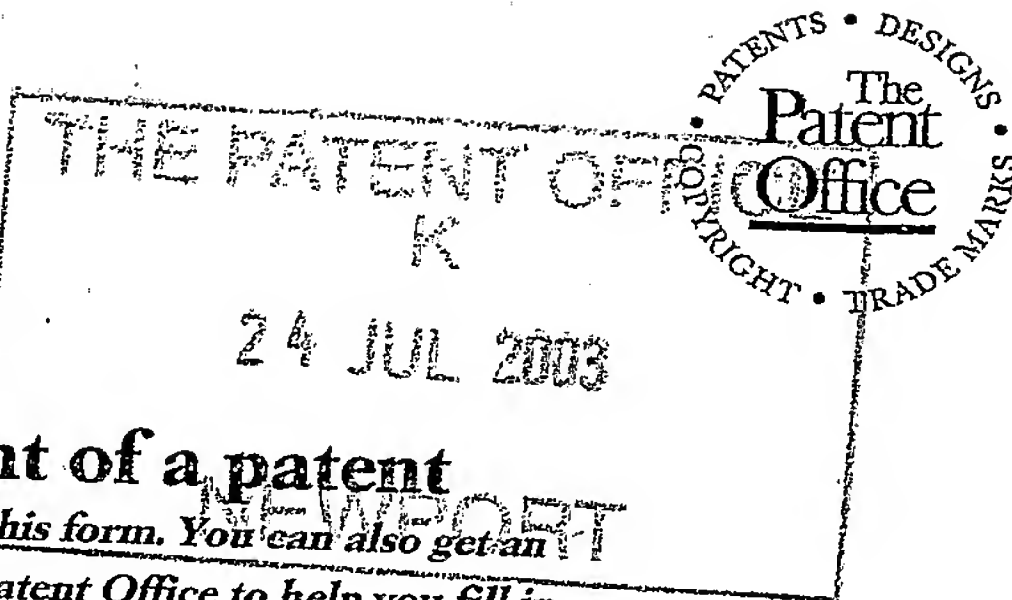
CINTEC INTERNATIONAL LIMITED,  
Cintec House,  
11 Gold Tops,  
NEWPORT,  
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United Kingdom

Incorporated in the United Kingdom,

[ADP No. 07929987002]



Patent Act 1977  
(Rule 1)



24JUL03 EB24865-1 D01559  
P01/7700 0.00-0317253.3

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Cardiff Road  
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# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference

RRH/VH/PJ129

2. Patent application number

(The Patent Office will fill in this part)

0317253.3

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Peter James  
2, Redd Landes  
Shirenewton  
Chepstow  
Gwent NP23 6QP  
07431 458001

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

SECTION 30 (1) PATENT APPLICATION FILED 24 JUL 2003

4. Title of the invention

Improvements in and relating to Blast and Collision Protection Structures.

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Wynne-Jones, Laine & James  
Morgan Arcade Chambers  
33 St. Mary Street  
Cardiff CF10 1AF

Patents ADP number (if you know it)

00001792002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing

(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing

(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

No.

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

# Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 6

Claim(s) 0

Abstract 0

Drawing(s) 2

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date

*Richard R Halstead*

23rd July 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Richard R Halstead  
01242 515 807

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## Notes

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.
- b) Write your answers in capital letters using black ink or you may type them.
- c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
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- e) Once you have filled in the form you must remember to sign and date it.
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Duplicate

Improvements in and relating to Blast and Collision Protection Structures

This invention relates to blast and collision protection structures of the type which are inflatable and which, in use, contain a liquid such as water as a means of mitigating the effects of an explosion blast from e.g. a car bomb or of a collision with e.g. a car.

In my earlier U.K. patent application numbers 0105998.9, 020119.5 and 0205570.5 I describe inflatable structures in the form of rupturable flexible containers which may typically be initially filled with air so as to provide the necessary shape, whereafter the air is replaced by water under pressure. The required shape is preferably maintained by the use of drop stitches between opposing internal walls of the structure so that, especially where the structure comprises a simple shape, such as a cube, individual structures can be mounted side-by-side and on top of other such structures to form a protective wall which, when filled with water, can mitigate against explosive blasts and/or the effects of collisions. More intricate shapes are also possible but because of the inherent weight and liquidity of water it has been found heretofore that there is a practical limit to the height that such structures can reach without requiring separate mechanical support. As will be appreciated, in the environment in which such structures are intended to operate mechanical support in the form of rigid supports themselves pose a danger of effectively becoming shrapnel when e.g. the structure is placed next to an explosive device which is then detonated such that as a practical matter a prerequisite of such inflatable water-filled containers is that they should not include or rely on any rigid materials and should instead be self-supporting in-use.



The present invention is derived from the realisation that a relatively high structure can be achieved through the use in combination of opposing pairs of walled water-containing or containable containers which are at least partially supported in-use by inflatable air-filled containers therebetween.

5           According to the invention there is provided apparatus for suppressing the effects of an explosion or collision, the apparatus comprising or including a pair of inflatable spaced-apart walled containers connected or connectable at respective upper ends to each other, either directly or indirectly, and connected or connectable at their respective lower ends to each other, and inflatable  
10 support cushion means disposed between the walled containers to at least partially support the walls thereof against collapse when filled with water.

Conveniently, the upper ends of the walled containers are connected together by webbing or strapping and the lower ends are splayed apart and connected to an inflatable base to form in combination therewith a structure of  
15 generally triangular section when inflated, whereafter following inflation of the support means, which may be partially or wholly of triangular section, so as to support all or part, as the case may be, the walled containers are then filled with water and the inflatable cushion thereafter prevents inward collapse under the weight of water.

20           Conveniently, the walls of the walled containers at least may be interconnected by drop stitches so as to prevent or inhibit outward bulging thereof in response to the weight of water contained therein, or alternatively each walled container may be comprised of a number of individual segments or cells which thereby minimise the tendency of each segment or cell to jeopardise



the required shape of the walled containers by collapsing under the weight of water. Instead of drop stitch construction, the internal walls of the walled containers may be interconnected by straps at strategic locations, which may conveniently be heat-welded in place.

5           Conveniently, the walled containers overlap with each other in a stepped or staggered formation such that adjoining ones of each apparatus may be interlinked to form a continuous wall of such structures, which may conveniently be interlinked with each other along the line of the wall by support webbing/strapping, such as through the use of strips of Velcro® webbing or  
10           strapping stitched to each one and adapted to interconnect with adjacent ones of such support structures.

          In a further refinement to the invention the support means may contain air or liquid or a mixture of both which may contain e.g. a fire retardant/suppressant or some other useful material which may be released following an explosion or  
15           collision event.

          The invention will now be described, by way of example only, with reference to the following drawings in which:

          Figure 1 is a schematic sectional view of blast/collision protection structure according to an embodiment of the invention, and

20           Figure 2 is a plan view of the embodiment of Figure 1, and

          Figure 3 is a plan view of a plurality of the structure shown in Figures 1 and 2 interconnected.

          Referring firstly to Figures 1 and 2 there is shown blast and/or collision suppressing apparatus in the form of a pair of oppositely disposed walled

containers 1,2 secured together at their respective upper, sealed, ends by means of webs 3 extending thereacross which may be stitched to the fabric of each of the containers 1,2 or may be releasably securable such as through the use of e.g. Velcro® strips etc.

5           The lower end of each walled container is connected to a base 4 which itself is a walled container which may be inflated to the position shown which, in combination with the two walled sides 1,2, form a generally triangular structure in section having a correspondingly shaped void or hollow therebetween into which may be disposed support means in the form of an inflatable cushion 5 of  
10 generally frusto-triangular shape for supporting the mid to lower portions of the walled containers 1,2 from inward collapse when the latter are filled with water.

As will be seen with reference to Figure 2, the walled containers 1,2 are connected to each other by the straps 3 in a stepped or staggered formation so that adjacent structures can overlap in a manner to be described. The base  
15 container 4 is arranged in this embodiment symmetrically relative to this staggered formation although it will be appreciated that it could instead be disposed wholly underneath one or other of the walled containers 1 or 2 or may be shorter than as shown in the drawing so that the edges do not project beyond the walled containers 1,2 when seen in plan view. Similarly, although the walled  
20 containers 1,2 are shown staggered with respect to each other they may not be and may instead be perfectly symmetrical with each other relative to the base container 4.

In use, water is introduced into the containers 1, 2 and 4 by any suitable means although in a preferred arrangement this is by first of all introducing air

compromised in the immediate aftermath of such an event, thereby allowing the water to absorb the energy of the blast and/or collision.

In a further refinement, the wall structure may be reinforced with webbing or strapping, such as by strips of Velcro®, running lengthways along the top, sides and/or bottom of the wall such that although it is composed of a number of individual inflatable structures as shown in Figures 1 and 2 the resultant composite wall structure may effectively be regarded as a single structure having the known advantages for suppressing the effects of an explosion or collision through the use of water, without using any rigid parts and whilst retaining sufficient height to ensure that damage to adjacent buildings etc. is minimised, as compared to existing self-supporting non-rigid structures of lower height.

Although the embodiment described comprises an essentially triangular structure in section in which the support means is in the form of a frusto-triangular inflatable cushion, it will nevertheless be apparent that other shapes may be possible using this general method of construction without departing from the spirit or scope of the invention.



1/2

FIGURE 1

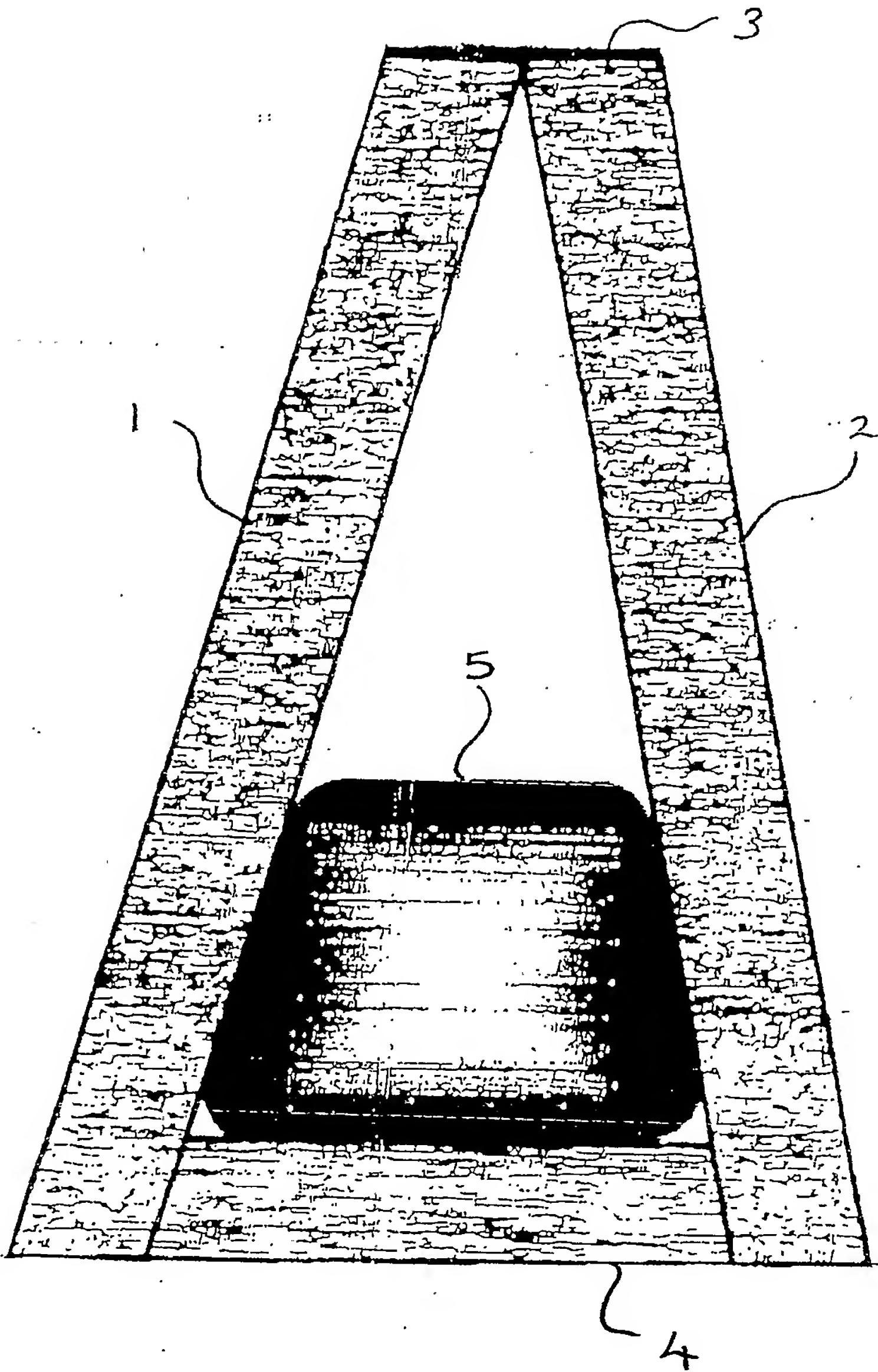
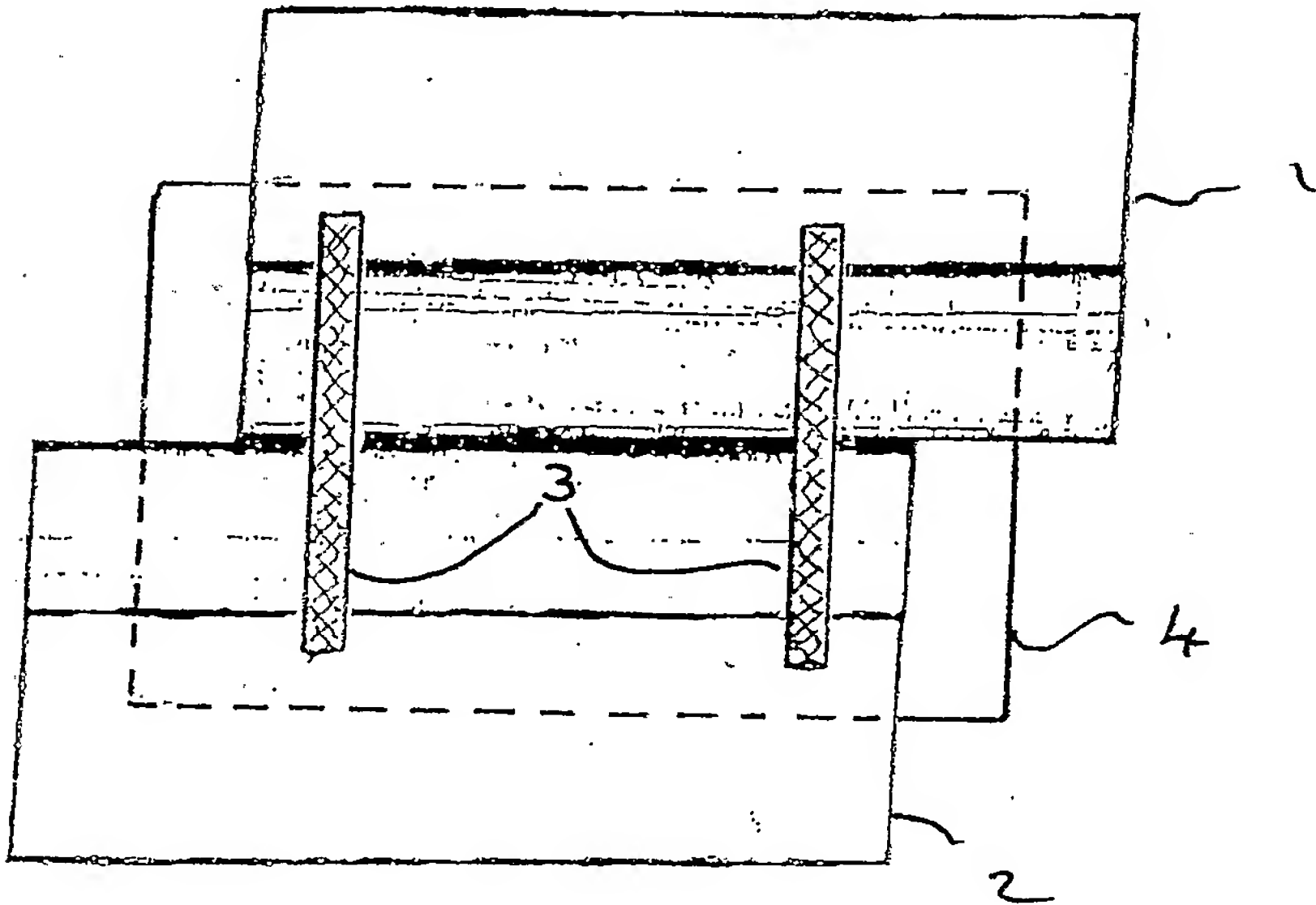


FIGURE 2





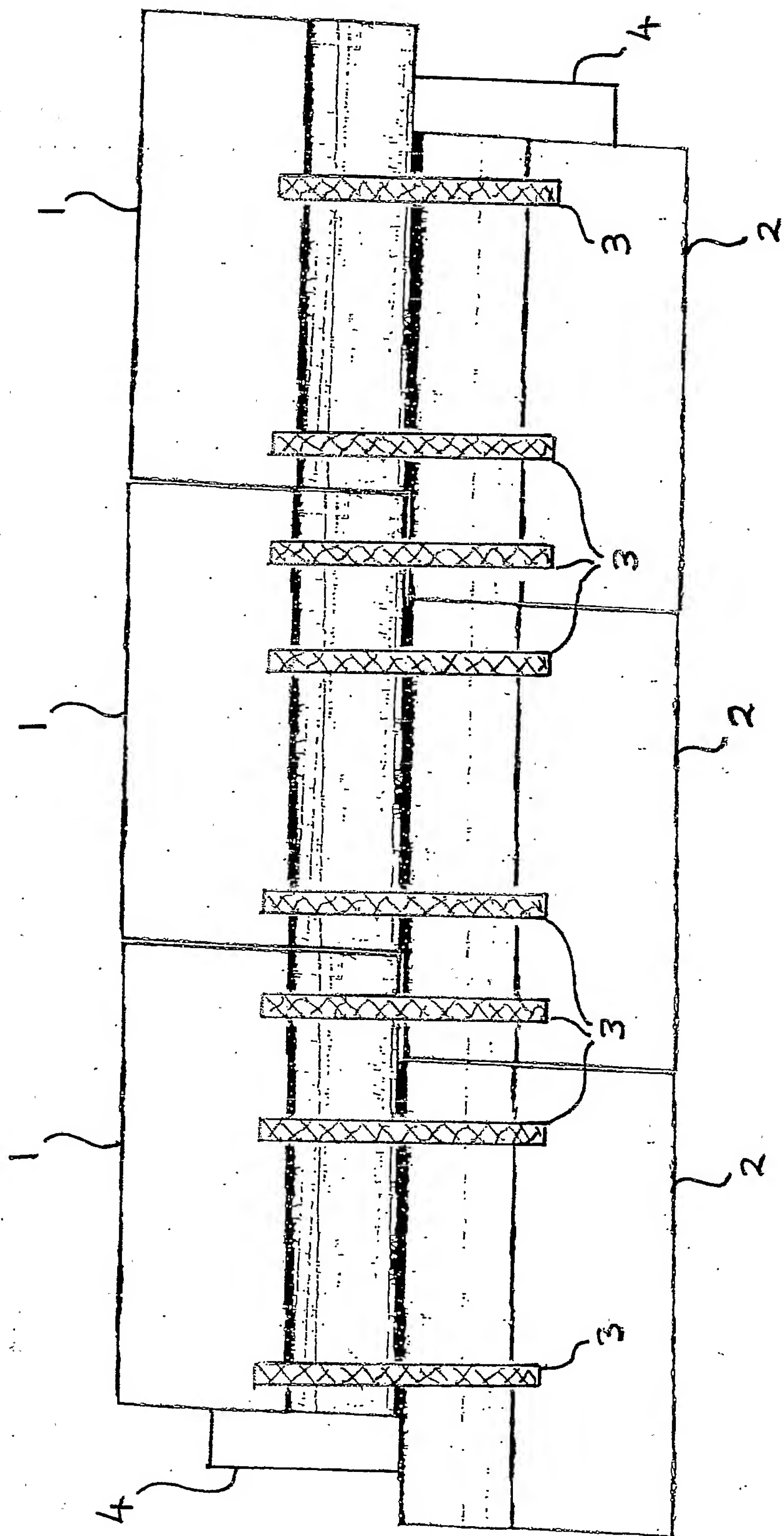


FIGURE 3



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